Abstract

Charles University, Faculty of Pharmacy in Hradec Králové

Department: Department of Pharmacognosy (16-16180)

Author: Štefan Kosturko

Supervisor: PharmDr. Marcela Šafratová, Ph.D.

Advisor: PharmDr. Daniela Hulcová, Ph.D.

Thesis title: Alkaloids of the family Amaryllidaceae and their biological activity II.

Key words: Narcissus pseudonarcissus dutch master; bulbs; alkaloidal extracts; GC/MS analysis; biological activity; acetylcholinesterase; butyrylcholinesterase.

The main aim of the thesis ,,Alkaloids of the family Amaryllidaceae and their biological activity II.'' was the isolation of alkaloids, as a pure substances, in sufficient quantities to identify their structure and to test their biological aktivity *in vitro*. Alkaloids were separated from subfraction number 82 – 97 of weigh 2,3268 g. This subfraction was a part of the total plant extract, which was prepared by PharmDr. Daniela Hulcová Ph.D., as a part of her dissertation thesis and who also performed primary extraction and separation work. A total and concentrated alkaloid extract weighing 58 g, which included the aforementioned subfraction, was obtained.

The already mentioned alkaloid subfraction, was divided by preparative thin-layer chromatography into five separates, which were subjected to further phytochemical work, and five pure alkaloids were obtained. These alkaloids were subjected to structural analysis by GC/MS, NMR and optical rotatory was also determined. Based on these data, alkaloids were identified as *O*-ethyllycorenine, epigalanthamine, galanthamine, galanthine and crinine.

Each substances was subjected to *in vitro* testing of inhibitory activity against human cholinesterases – acetylcholinesterase and butyrylcholinesterase, prolyl oligopeptidase and glycogensynthase kinase 3β. Compared to the standards and literature, all of the obtained alkaloid substances, except galanthamine (IC_{50} *hu*AChE 1,70 ± 0,10 µM; IC_{50} *hu*BChE 42,30 ± 1,30 µM), show weak inhibitory potential against all of the enzymes which were tested.